

AI Planning

Exercise Sheet 4

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Exercise 4.1

For easy readability let the tiles be referred to as b_1 , b_2 , w_1 and w_2 and the empty cell be referred to as e . Furthermore, let the actions move and jump be denoted as $m_c(t)$ and $j_c(t)$ respectively where c is the destination cell $\in \{1, 2, 3, 4, 5\}$ and t is the tile that is being relocated.

As an example, the initial state is:

b_1, b_2, w_1, w_2, e

If we then apply $j_5(b_2)$ we reach:

b_1, e, w_1, w_2, b_2

(a) Let $[o]$ be the search node σ reached by applying the operation $o \in \{m_c(t), j_c(t)\}$.

$$f([m_5(w_2)]) = 1 + 4 = 5$$

$$f([j_5(w_1)]) = 1 + 4 = 5$$

$$f([j_5(b_2)]) = 2 + 2 = 4$$

Apply $j_5(b_2)$ which results in σ_1 :

b_1, e, w_1, w_2, b_2

$$f([m_2(b_1)]) = 5 + 2 = 7$$

$$f([m_2(w_1)]) = 5 + 2 = 7$$

$$f([j_2(w_2)]) = 5 + 2 = 7$$

$$[j_2(b_2)] = I \in \text{closed}$$

Apply $m_2(b_1)$ which results in σ_2 :

e, b_1, w_1, w_2, b_2

Apply $m_2(w_1)$ which results in σ_3 :

b_1, w_1, e, w_2, b_2

Apply $j_2(w_2)$ which results in σ_4 :

b_1, w_2, w_1, e, b_2

Expanding on σ_2 :

(b)

Exercise 4.2

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